Game over? New AI challenge to human smarts (Update)

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Lee Se-dol has for a decade held the world crown Go, a board game widely played for centuries in East Asia

Every two years or so, computer speed and memory capacity doubles—a head-spinning pace that experts say could see machines become smarter than humans within decades.

This week, one test of how far Artificial Intelligence (AI) has come will happen in Seoul: a five-day battle between man and machine for supremacy in the 3,000-year-old Chinese board game Go.

Said to be the most complex game ever designed, with an incomputable number of move options, Go requires human-like "intuition" to prevail.

"If the machine wins, it will be an important symbolic moment," AI expert Jean-Gabriel Ganascia of the Pierre and Marie Curie University in Paris told AFP.

"Until now, the game of Go has been problematic for computers as there are too many possible moves to develop an all-encompassing database of possibilities, as for chess."

Go reputedly has more possible board configurations than there are atoms in the Universe.

Mastery of the game by a computer was thought to be at least a decade away until last October, when Google's AlphaGo programme beat Europe's human champion, Fan Hui.

Google has now upped the stakes, and will put its machine through the ultimate wringer in a marathon match starting Wednesday against South Korean Lee Se-dol, who has held the world crown for a decade.

South Korean Go grandmaster Lee Se-Dol (C) with Google Deepmind head Demis Hassabis (L) and Eric Schmidt (R), the executive chairman of Google owner Alphabet, at a conference ahead of the Google DeepMind Challenge Match in Seoul on March 8, 2016

Initially confident of winning by 5-0, or 4-1 at worst, and taking home the $1 million (908,000 euro) prize money, Lee's courage seemed to have started waning by Tuesday.

He told reporters in Seoul the programme seemed

to work "far more efficiently" than he thought at first, and "I may not beat AlphaGo by such a large margin".

Man vs Machine

Game-playing is a crucial measure of AI progress—it shows that a machine can execute a certain "intellectual" task better than the humans who created it.

Key moments included IBM's Deep Blue defeating chess Grandmaster Garry Kasparov in 1997, and the Watson supercomputer outwitting humans in the TV quiz show Jeopardy in 2011.

But AlphaGo is different.

It is partly self-taught—having played millions of games against itself after initial programming to hone its tactics through trial and error.

IBM's Deep Blue defeated Russian chess Grandmaster Garry Kasparov in 1997

"AlphaGo is really more interesting than either Deep Blue or Watson, because the algorithms it uses are potentially more general-purpose," said Nick Bostrom of Oxford University's Future of Humanity Institute.

Creating "general" or multi-purpose, rather than "narrow", task-specific intelligence, is the ultimate goal in AI—something resembling human reasoning based on a variety of inputs, and self-learning from experience.

"So, if the machine can do new things when needed, then it has 'true' intelligence'," Bostrom's colleague Anders Sandberg told AFP.

In the case of Go, Google developers realised a more "human-like" approach would win over brute computing power.

AlphaGo uses two sets of "deep neural networks" containing millions of connections similar to neurons in the brain.

It is able to predict a winner from each move, thus reducing the search base to manageable levels—something co-creator David Silver has described as "more akin to imagination".

Professor Stephen Hawking is among the leading voices of caution regarding artifical intelligence

Master or servant?

What if we manage to build a truly smart machine?

For some, it means a world in which robots take care of our sick, fly and drive us around safely, stock our fridges, plan our holidays, and do hazardous jobs humans should not or will not do.

For others, it evokes apocalyptic images in which

hostile machines are in charge.

Physicist Stephen Hawking is among the leading voices of caution, warning last May that smart computers may out-smart and out-manipulate humans, one day "potentially subduing us with weapons we cannot even understand."

For Sandberg, it will be up to us to build "values" into the operating system of intelligent computers.

There are more than 10 million robots in the world today, according to Bostrom—everything from rescuers and surgical assistants, home-cleaners, route-finders, lawn-mowers and factory workers, even pets.

But while machines may beat us at Checkers or maths, some experts think robots may never rival humans in some aspects of "true" intelligence.

Things like "common sense" or humour may never be reproducible, said Ganascia.

"We can imagine that in the future, ever more tasks will be executed by machines better than by humans," he said.

"But that does not mean that machines will be able to automate everything that our cognitive faculties allow us to do. In my view, this is a limitation that keeps the scientific discipline of AI in check."

For Lee, it now seems "inevitable" that AI will ultimately defeat humans at Go.

"But robots will never understand the beauty of the game the same way that we humans do," he said.

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